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FOUR EMBARCADERO CENTER • FOURTH FLOOR
SAN FRANCISCO • CALIFORNIA 94111-4156
TELEPHONE      415.362.3800
FACSIMILE      415.362.2928
INTERNET       www.FDML.COM

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TO:          __USPTO Examining Group 2600 and Examiner Yuwen Pan__

FAX NO.:     __(703)872-9314 and (703)746-8783__

FROM:        __Thomas A. Ward__

RE:          __Interview Summary for Interview Conducted 9/28/04__

DATE:        __October 6, 2004__ Total Pages : __11 (including fax cover sheet)__

Original will follow by mail: _No_
If you do not receive all of the pages, please call __Sherri Hale__ at 415.362.3800.

*In re Application:*

| | | | |
|---|---|---|---|
| *Inventors:* | Wong, et al. | *Appli. No.:* | 09/847,005 |
| *Confirm. No.:* | 5364 | *Filed:* | May 2, 2001 |
| *Entitled:* | Network Communication System Using Assigned Timeslots For Nodes To Request A Bandwidth Amount For Data Transmission With Resulting Grant For The Node To Transmit | | |

Please see the attached:

1)   Interview Summary For Interview Conducted September 28, 2004;
2)   Declaration of Samuel F. Wood; and
3)   Declaration of Udo W. Pooch, Ph.D., P. E.

*Trina,
Please Enter
this Declaration
Thanks!
Yuyen
10/12/04*

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## IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

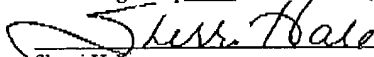| | |
|---|---|
| In re Application<br>Inventors: Wong, et al.<br>SC/Serial No.: 09/847,005<br>Confirm. No.: 5364<br>Filed: May 2, 2001<br>Title: Network Communication System Using Assigned<br>Timeslots For Nodes To Request A Bandwidth<br>Amount For Data Transmission With Resulting<br>Grant For The Node To Transmit | PATENT APPLICATION<br><br>Art Unit: 2686<br>Examiner: Yuwen Pan<br><br><br>**Customer No. 23910** |

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I hereby certify that this correspondence is being transmitted by facsimile
to the Commissioner for Patents, the United States Patent and Trademark Office,
Examining Group 2600, Facsimile No. (703) 872-9314, on October 6, 2004.

Sherri Hale

Signature Date: October 6, 2004

## INTERVIEW SUMMARY FOR INTERVIEW CONDUCTED
## SEPTEMBER 28, 2004

Commissioner for Patents
Washington, D.C. 20231

Sir:

Provided below is the summary of discussions from a telephone interview held between

the undersigned, Thomas A. Ward, and Examiner Lester Kinkaid on September 28, 2004.

Examiner Kinkaid initially indicated he had reviewed the interview summaries for both

September 23, 2004 and September 24, 2004, and had generally reviewed the case as requested to

assist Examiner Yuwen Pan. Examiner Pan was on vacation and not present for the interview

with his Supervisor Primary Examiner Lester Kinkaid.

Regarding the definition of "bandwidth" Examiner Kinkaid stated that he interpreted the

definition for bandwidth from the previous interviews - "The amount of data that can be passed

along a communications channel in a given period of time" - to encompass a data rate, such

bits/second. He indicated that he did not believe that Applicants' disclosure disclosed such a data rate, and that previous submissions by Applicant had not yet overcome his contention that the claim term "bandwidth" is new matter.

In response, Applicant pointed out that this application dealt with transmission of "packet data," so an indication of "amount of data" from a transmitter revealed a fractional or average "bandwidth." Applicant pointed out that with conventional dedicated channels from a pager to a controller (one channel per pager), requesting "bandwidth" in terms of a data amount in bits/second required an indication of both data and time for synchronization. Applicant stated that the term "bandwidth" in bits/second is still appropriate in packet systems, but with packet transmissions by multiple pagers over a single channel having a fixed clock rate or fixed time slots, requesting a specific "amount of data" requests a fraction of the total data that can be transmitted on the channel f3 available to all requesting pagers. Thus "bandwidth" for a packet based system for one pager is revealed by the fractional amount of data being transmitted by one pager, with a total time (the time being allocated for all pagers over the channel) for bandwidth remaining fixed.

Applicant argued the patent application necessarily discloses "bandwidth" under an inherency theory of M.P.E.P. 2163.07(a). Applicant stated that the application discloses a packet type transmission system with clock cycle frequency and time slot lengths that remain fixed on channel f3 as illustrated in Fig. 6, so a request providing an "amount of data" to be transmitted inherently revealed "bandwidth" since the amount of time being allocated to pagers remains fixed and already known by the controller. As indicated by M.P.E.P. 2163.07(a), "[b]y disclosing in a patent application a device that inherently performs a function or has a property, operates according to a theory or has an advantage, a patent application necessarily discloses that function, theory or advantage, even though it says nothing explicit concerning it."

Applicants further indicated that they would prepare a declaration from a person of ordinary skill in the art under 37 CFR § 1.132 at the earliest priority date for the present invention in June, 1994 to support the skilled artisan's view of the meaning of the term "bandwidth" in

terms of the packet based system of applicant's disclosure. Two such a declaration from Sam Wood, and Dr. Udo Pooch on the term "bandwidth" are attached hereto. The declarations support that with a packet type system, requesting "bandwidth" requires only an "amount of data" to be revealed since each pager is given a fractional amount of a total amount of data that can be transmitted during a fixed time period. Each pager, thus, is allocated a "bandwidth" in bits per second revealed by the total data they transmit (as indicated in their request for bandwidth) over the total time being allocated (that remains fixed). This meets the requirement of M.P.E.P. 2163 IIA3(b) which states "When an explicit limitation in a claim is not present in the written description whose benefit is sought it must be shown that a person of ordinary skill would have understood, at the time the patent application was filed, that the description requires that limitation."

Examiner Kinkaid said that he would consider Applicants' argument and Section 132 declaration submitted along with Examiner Pan and provide a further indication to Applicants on the allowability of the present application.

Respectfully submitted,

Date: ___10/6/04___          By: ___Thomas Ward___

                                 Thomas A. Ward
                                 Reg. No. 35,732

FLIESLER MEYER LLP
Four Embarcadero Center, Fourth Floor
San Francisco, California 94111-4156
Telephone: (415) 362-3800

## DECLARATION OF UDO W. POOCH, Ph.D., P.E.

1.    My name is Udo W. Pooch. I am over twenty-one years of age and am fully competent to make this Affidavit. I have personal knowledge of the facts set forth in this declaration, and they are true and correct. I have never been convicted of a felony or a crime involving moral turpitude.

2.    I have an educational and work experience background as detailed in the declaration filed and signed by me on August 17, 2004 for submission with a Response filed September 17, 2004 in U.S. Patent Application Serial No. 09/847,005 that is incorporated herein without repeat.

3.    My above referenced experience relating to packet communications and telecommunications, particularly my efforts in research, publishing and teaching in these subject areas, supports the conclusion that I was a person of ordinary skill in the art related to the subject matter of the invention described in U.S. Patent Application No. 09/874,005 at the time of its earliest priority date, June 24, 1994.

4.    I have reviewed U.S. Patent Application No. 09/874,005, including the claims, the latest Office Action dated June 17, 2004, the Response Dated August 17, 2004, and the interview summary records for interviews held on September 23 and 24, 2004. In particular, I have reviewed Examiner Pan and Examiner Kinkaid's comments regarding the definition of the term "bandwidth" and their interpretation of the term "bandwidth" with respect to the present application.

5.    Based on my experience up to June 24, 1994 and the state of the art at that time, as stated in my declaration previously signed August 8, 2004, "bandwidth must be understood in a general fashion to refer to a limited resource of the communications system that is somehow allocated. Here, the signal bandwidth is fixed but must be shared by all requestors (requestors referring to pager units or nodes as referenced in U.S. Patent Application No. 09/874,005). Thus, bandwidth refers to the time needed by a requestor to transmit a given message, that time being determinable from the message length."

6.    Further details of my interpretation of the term "bandwidth" as related to the 09/847,005 case is as follows –

     a.   For communication links, information signals are carried using one or more frequencies. The amount of frequencies needed conventionally was termed bandwidth. In the old days (1940s and earlier), information signals were analog signals that carried voice or television. The more information

a signal carried, the more frequencies it occupied, the more bandwidth.
For example, telephone quality voice can be carried in around 3 KHz,
while TV signals requires around 4 MHz. Therefore, each of these signals
required communication links that had sufficient bandwidth.

b.  Around the 1940s, people started to think about computers and
bits (which is the way computers process and store information).
In 1948, Claude Shannon presented his paper that gives the
rate of bits a communication link can transmit. The formula
is roughly

$$C = BW * \log(1 + SNR)$$

where
$C$ = the maximum data rate of the link (e.g., bits per second). This is
sometimes referred to as the channel capacity;
$BW$ = the bandwidth of the link; and
$SNR$ = the signal to noise ratio of the link, i.e., the signal power divided
by the noise power.

If the SNR is constant then the maximum data rate $C$ is proportional to the
bandwidth $BW$. This is why people use "bandwidth" and "data rate"
interchangeably.

c.  In the paging system, there are data channels to be shared by multiple
users, but users cannot transmit simultaneously. Instead, they must wait
their turn to access the channels but when they have access they can use
the full capacity (or data-rate). This is an example of statistical
multiplexing which is common in packet switched systems.

d.  In the paging system described in Application No. 09/847,005, nodes
access channels to send a specified number B of bits, e.g., message
length. Then $T = B/C$ is the total time needed for transmitting the
message and $N=T/t$ is the number of time slots necessary. To a person of
ordinary skill in the art in 1994, B, T and N are interchangeable terms that
may be used to refer to the bandwidth necessary to transmit the message.

e.  To summarize, common use of the term bandwidth refers to a resource of
the communication channel. That resource may be data rate, message
length or time. To be allocated a specific amount or fraction of the
bandwidth needed to transmit its packets, a transmitter need only specify
an "amount of data or packets" in each message.

7.  In conclusion from review of the specification, I (or a person of ordinary skill)
would have understood at the time the original priority application was filed in

June of 1994 that requesting "bandwidth" requires only an "amount of data" to be revealed.

8.      I further declare that all statements made herein of my own knowledge are true and that all statements made on information and belief are true; and further that these statements were made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under Section 1001 of Title 18 of the United States Code, and that such willful false statements may jeopardize the validity of the above-referenced application or any patent issuing thereon.

_____          _10/4/04_
Udo W. Pooch, Ph.D., P.E.                    Date
Raytheon Professor of Computer Science

DECLARATION OF SAMUEL F. WOOD.

1.  My name is Samuel F. Wood.  I am over twenty-one years of age and am fully     competent to make this Affidavit.  I have personal knowledge of the facts set forth in this declaration, and they are true and correct.  I have never been convicted of a felony or a crime involving moral turpitude.

2.  I have an educational and work experience background as detailed in the declaration filed and signed by me on August 17, 2004 for submission with a Response filed September 17, 2004 in U.S. Patent Application Serial No. 09/847,005 that is incorporated herein without repeat.

3.  My above referenced experience relating to packet communications and telecommunications supports the conclusion that I was a person of ordinary skill in the art related to the subject matter of the invention described in U.S. Patent Application No. 09/874,005 at the time of its earliest priority date, June 24, 1994.

4.  I have reviewed U.S. Patent Application No. 09/874,005, including the claims, the latest Office Action dated June 17, 2004, the Response Dated August 17, 2004, and the interview summary records for interviews held on September 23 and 24, 2004.  In particular, I have reviewed Examiner Pan and Examiner Kinkaid's comments regarding the definition of the term "bandwidth" and their interpretation of the term "bandwidth" with respect to the present application.

5.  Based on my experience up to June 24, , my interpretation of the term "bandwidth" in light of U.S. Patent Application No. 09/874,005 is as follows:

    a.  For communication links, information signals are carried using one or more frequencies. The amount of frequencies needed conventionally was termed bandwidth.  In the old days (pre- 1940), information signals were analog signals that carried voice or television.  The more information a signal carried, the more frequencies it occupied, the more bandwidth.  For example, telephone quality voice can be carried in around 3 KHz, while TV signals requires around 4 MHz.  Therefore, each of these signals required communication links that had sufficient bandwidth.

b.  Around the 1940s, people started to think about computers and bits (which is the way computers process and store information). In 1948, Claude Shannon presented his paper which gives the rate of bits a communication link can transmit. The formula is roughly

$$C = B * \log (1 + SNR)$$

where
C = the data rate of the link (e.g., bits per second). This is sometimes referred to as the channel capacity;
B = the bandwidth of the link; and
SNR = the signal to noise ratio of the link, i.e., the signal power divided by the noise power.

If the SNR is constant then the data rate C is proportional to the bandwidth B. This is why people use "bandwidth" and "data rate" interchangeably.

Note that data rate can be computed by b/t, where
b = number of bits transmitted in a time period
t = length of the time period in seconds.
Then b/t is the data rate in bits per second.

c.  In the paging system, there are data channels to be shared by multiple users, but users cannot transmit simultaneously. Instead, they must wait their turn to access the channels, but when they have access they can use the full capacity (or data-rate). This is an example of statistical multiplexing which is common in packet switched systems.

d.  In the paging system described in Application No. 09/847,005, nodes access channels to send a specified number of bits "b" e.g., message length. Suppose "t" is the length of time we will examine e. g. one second. Then b/t is the average rate. Requesting b is the same as requesting b/t as t is set to one second.

e.  To summarize, conventional bandwidth is a data-rate, e.g., measured in bits per second. The bandwidth for packet based systems using a single channel with multiple transmitters is an "average" data-rate for transmission by a node over a second in b/t, where b is the number of bits sent in a second and t is one second. To request access to send b number of bits is the same as requesting bandwidth of b/t. As the second proceeds, each

transmitter is allocated a fraction of the bandwidth over the second, so that at the end of the second, the total bandwidth allocated to each pager can be calculated.  To be allocated a specific amount or fraction of the bandwidth needed to transmit its packets, a transmitter need only specify an "amount of data or packets" in each message and time for bandwidth remains a fixed period, e.g. one second.

f.  I think it may be possible to illustrate the concept of bandwidth in a paging system through the use of an example:

The FCC assigns a paging company a channel data *1 megbit/sec* bandwidth of 1 megabit, or 1,000,000 bits, per second. This translates to 125,000 bytes per second. Assuming an average length of 125 bytes per packet, this translates to 1000 packets per second. A paging controller assigns pieces of this bandwidth to users needing to transmit data. If a user needs to transmit 10 packets, the controller would assign sufficient bandwidth for the 10 packets (10 packets * 125 bytes/packet * 8 bits/byte = 10,000 bits) or 1% (10,000/1,000,000 = 1/100 = 1%) of the total bandwidth to that user during that second.  When the user transmits, he transmits at a data rate of 1 megabit per second, however since that given user is only transmitting 10 packets, or  *1250 bytes* 10,000 bits, and we are averaging the time over 1 second, the bandwidth is 10,000 bits per second for that user. During that second, 100 users could each transmit 10 packets, or one user could transmit 1000 packets.

If one adds up the bandwidth occupied by each user, the total bandwidth of all the users should equal the bandwidth at the radio channel (assuming the radio channel is 100% utilized.)

From this example, it is clear that one need only specify the number of bits, bytes, or packets to specify the amount of bandwidth needed.

6.    In conclusion from review of the specification, I (or a person of ordinary skill) would have understood at the time the original priority application was filed in June of 1994 that requesting "bandwidth" requires only an "amount of data" to be revealed.

7.    I further declare that all statements made herein of my own
      knowledge are true and that all statements made on information and
      belief are true; and further that these statements were made with the
      knowledge that willful false statements and the like so made are
      punishable by fine or imprisonment, or both, under Section 1001 of
      Title 18 of the United States Code, and that such willful false
      statements may jeopardize the validity of the above-referenced
      application or any patent issuing thereon.


      _____              _____
      Samuel F. Wood                        Date